MCA –SECOND SEMESTER

Course title: **Computer networks**
Course no: **PSCSATC222**
No. of credits: **04**
Total marks: **100**

Minor Test 1:   **20 Marks of 1.5 hours duration**
Minor Test 2:   **20 Marks of 1.5 hours duration**
Major Test: **60 Marks of 3.0 hours duration**

For examinations to be held in May- 2022, 2023, and 2024

Course objectives & learning outcomes:
1. To study the basic taxonomy and terminology of the computer networking model and architecture.
2. To study the fundamentals of data communication and protocols.
3. To study network design and performance issues.
4. To explore the basic knowledge of cryptography and network security.

UNIT–I   Fundamentals of Communication
Fundamentals of Communication, Modulation, Data Encoding, OSI reference model, TCP/IP model, network standardization, Inter-networking. Physical layer, Switching Technique, Transmission media, Co-axial, Twisted Pair and Fiber Optic Cables, Transmission Impairments, Electromagnetic Spectrum, Radio waves, Microwaves, Satellites, Wireless Mobile Telecommunications Technology.

UNIT–II   Data Transmission and Media access Methods
Data Link layer, Design issues, Frame, Error detection and correction, Flow Control, Elementary Data link protocols, Character-oriented and Bit-oriented Protocols, Sliding window protocols.
Channel allocation methods, TDM, FDM, ALOHA, Carrier sense Multiple access protocols, Collision free protocols, IEEE standard 802 for LANS, Ethernet, Token Bus, Token ring**.**

UNIT–III   Network Establishment Concepts
Network Layer, Store and Forward Packet Switching, Connectionless and Connection-oriented services, Virtual Circuit, Routing Algorithms, Shortest path, Flooding, Link State, Distant vector, Hierarchical, Broadcast and Multicast Routing. OSPF, BGP, Congestion, Congestion control algorithms**.**

UNIT–IV   Internet Protocols
TCP/TP Protocol, IP Addresses, Classes of IP Addresses, Subnets, IPv6, Network layer in the Internet, Internet Control Protocols, ARP, RARP, BOOTP, DHCP, Transport Layer, Protocol Stack, TCP and UDP, Transport Services Primitives, Sockets, Socket Programming concept.

UNIT–V   Network Application and Network Security
Application layer, Name service (DNS), Domain Hierarchy, Name servers, Name resolutions, Traditional applications, Telnet, FTP, SMTP, MIME, World wide web-HTTP, HTTP Methods.
Cryptographic Algorithms, DES, AES, RSA, Key exchange methods, Authentication Protocol, Digital Signatures.

Suggested readings/ references:
1. Andrew S. Tanenbaum, "Computer Networks", 5 e, 2013, Pearson Education Asia.
2. Behrouz A. Forouzan, "Data Communications and Networking", 4e, 2004, Tata McGraw Hills.
3. William Stallings. "Data and Computer Communication", 7e, 2016, Pearson Education Asia.
4. Prakash C. Gupta, "Data Communications and Computer Networks", PHI
5. Michael A. Miller, "Data and Network Communications", 2e, Delmar Thomson Learning.
6. James F. Kurose and Keith W. Ross, "Computer Networking", 3e, Pearson Education.
7. William A. Shay, "Understanding Data Communications and Networks", 2e, Thomson Asia Pvt. Ltd.

NOTE FOR PAPER SETTERS FOR MAJOR EXAMINATIONS -
The question paper shall be divided into sections A & B as below. No question shall be repeated in the question paper.
Section A - There shall be FIVE short answer type questions of THREE mark each. In this section, questions shall be covered from each unit and the candidates shall be required to answer all the questions. *(3 x 5 = 15 marks)*
Section B - There shall be THREE long answer type questions each set from Unit –III, IV and V with internal choice. Each question shall carry FIFTEEN marks. *(3 x 15 = 45 marks)*